General Specifications

GX20/GP20 (/CM2 option)  GM (/CM2 and /CS2 options)
920MHz Wireless Communication

OVERVIEW

Wireless communication (902.1 to 927.9MHz band) enables the GX20(/CM2), GP20(/CM2), GM10(/CM2) to communicate as a master with compatible GM10 slaves (/CS2), UT52A/UT32A(suffix code type 3:B), and Wireless Input Unit (GX70SM), other Modbus devices and wireless communication sensors.

Because slaves are equipped with a repeater function, they can be used to extend the communication distance.

(This product can only be used in the US.)

Features

• A single master can accommodate up to 100 slaves.*1 This is limited to 99 for the UT.
• The output larger than that of conventional specified low power radio achieving a range of about 800 m*2 with a clear line-of-sight.
• With multi-hop connection, even when wireless communication is cut off due to temporary deterioration in radio conditions, the most suitable communication route is automatically selected.
• GM10 slaves (/CS2 option) and UT slaves can be used as repeaters to extend communication distance and improve radio quality.
• Features of the 900 MHz band (compared to the 2.4 GHz band)
  • Because the radio frequency is low, radio signals attenuate less in the transmission route.
  • Because the radio frequency is low and the tendency to go straight is lower, the radio signals can more easily diffract around obstacles.
• No license is required.

*1 The number of units that can connected may be limited by the communication data size or the transmission interval. When used for low-speed moving bodies, the maximum number of routers is limited to 50 including repeaters.

*2 The range depends on the operating environment.

For the detailed specifications of the GX20, see the following general specifications.
Material No.: GS 04L51B01-01EN

For the detailed specifications of the GP20, see the following general specifications.
Material No.: GS 04L52B01-01EN

For the detailed specifications of the GM10, see the following general specifications.
Material No.: GS 04L55B01-01EN

For the detailed specifications of the I/O modules, see the following general specifications.
Material No.: GS 04L53B01-01EN

For the detailed specifications of the Digital Indicating Controller, see the following general specifications.
Material No.: GS 05P01D81-01EN

For the detailed specifications of the Wireless Input Unit (GX70SM), see the following general specifications.
Material No.: GS 04L57B01-01EN
**SPECIFICATIONS**

- **920 MHz wireless communication (/CM2 and /CS2)**
  - Wireless communication standard: FCC Part 15 Subpart C (§15.247)
  - Carrier frequency band: 902.1 to 927.9 MHz
  - Wireless channel spacing: 600 kHz
  - Number of wireless channels: 43
  - Maximum transmission output: 20 mW
  - Modulation method: GFSK
  - Antenna: External antenna (sold separately), RP-SMA-P connector
  - Maximum number of slave receptions: 100 (number of slave receptions by a single master, varies depending on the communication conditions)
  - Maximum packet size: 2048 bytes
  - Data rate: 100 kbps max.
  - Communication distance (line-of-sight distance): 800 m max. (depends on the operating environment)
  - Communication format: Mesh/multi-hop* (maximum number of hops: 16)
    - A function that automatically selects the best communication path according to the communication quality between units. It can be used to extend the communication distance and improve the radio quality.
  - LED display: Displays the wireless status using ST1 (green/red) and ST2 (green/red)
  - Security function: AES 128 bit encryption
  - Implemented protocol: Modbus (master/slave) protocol
  - Modbus slave function (/CS2 option): Data can be written and read from Modbus master devices (masters (/CM2 option)).
  - Modbus master function* (/CM2 option): Reading and writing data to Modbus slave device
    - The communication channel function (/MC option) is required. Read data is written to communication channels.

**Communication cycle:**
- When receiver function is [Modbus master] 500 ms, 1 s, 2 s, 5 s, 10 s, 1 min
- When receiver function is [Wireless input unit] 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, 1 h

**Note:** Only the above communication cycles will work properly.

**Number of commands:** 100

**Command types:** Off, read, write

**Configuration/measurement communication:** The following functions are available using the dedicated software.
- GM10 wireless communication settings
- Information about slaves connecting to the GM10
- GM10 wireless communication status monitoring
- MH920 Console International, a console software application made by Oki Electric Industry Co., Ltd.
- Wireless communication configuration interface: USB 2.0 mini-B type
- Reboot switch: For rebooting the system after changing wireless settings

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<table>
<thead>
<tr>
<th>Number of slaves</th>
<th>Modbus communication cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500ms</td>
</tr>
<tr>
<td>1</td>
<td>125ch</td>
</tr>
<tr>
<td>2</td>
<td>80ch</td>
</tr>
<tr>
<td>4</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>--</td>
</tr>
</tbody>
</table>

* Number of channels for 1 word data (INT16, UINT16). This varies depending on the processing load in the device and communication quality.

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**Dedicated external antenna (sold separately):**

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>Sleeve antenna</td>
</tr>
<tr>
<td>Installation</td>
<td>Roof top antenna</td>
</tr>
<tr>
<td>environment</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>2.5 m</td>
</tr>
<tr>
<td>Antenna type</td>
<td>Dipole</td>
</tr>
<tr>
<td>Directivity</td>
<td>Standalone</td>
</tr>
<tr>
<td>Connector</td>
<td>RP-SMA-P</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20 to 65°C</td>
</tr>
<tr>
<td>Waterproof property</td>
<td>Not waterproof</td>
</tr>
<tr>
<td>Dimensions</td>
<td>196 mm (including the connector)</td>
</tr>
<tr>
<td></td>
<td>83 mm (including the base stand)</td>
</tr>
</tbody>
</table>

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**Note 1:** Can only be used in combination with the dedicated antenna.
**Note 2:** When using an external antenna, we recommend aligning the direction of the antenna of the peer device and the direction of the antenna of this device to maintain communication quality.
**Note 3:** To bring out the full performance of the roof top antenna, install it on top of a metal rectangle board that is at least 10 x 20 cm long.
**Note 4:** Install antennas as far as possible from metal objects and other obstacles. The communication quality may deteriorate if they are close.

**Compliant Standards**

- **GX20 (/CM2 options), GP20 (/CM2 option)**
- **GM10 (/CM2 and /CS2 options)**
  - Only US FCC standards and CSA/UL standards are supported.
- **GM90PS (/W option)**
  - CSA/UL standards are not supported.
- **Wireless Input Unit Support Function of the GX20/GP20/GM10 (CM1 option) (R4.02.01 and later)**

Data collection and status monitoring of wireless input units are possible.

- **Number of GX70SM connections**

<table>
<thead>
<tr>
<th>Model</th>
<th>Measurement mode (GX/GP/GM)</th>
<th>Normal</th>
<th>High speed</th>
<th>Dual interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX20-1/GP20-1/GM10-1</td>
<td>Max. 50 devices</td>
<td></td>
<td></td>
<td>Max. 30 devices</td>
</tr>
<tr>
<td>GX20-2/GP20-2/GM10-1</td>
<td>Max. 96 devices</td>
<td></td>
<td></td>
<td>Max. 50 devices</td>
</tr>
</tbody>
</table>

* The number of technically possible connections varies depending on the wireless communication condition and the measurement/transmission interval.

- **Auto configuration function**
  Automatically configures the wireless input unit data collection settings.

- **Wireless data dropout detection function**
  Detects data collection dropouts due to wireless communication errors or the like.

- **Management, monitoring, and maintenance functions**
  Displays wireless input unit information.
  Status monitoring and maintenance period management are available.

- **Loop calibration function**
  Wireless input data correction using the calibration correction function

- **Web application and Hardware Configurator also support wireless input unit functions.**
HARDWARE SPECIFICATIONS

- External dimensions

GX20

When using the sleeve antenna

![Sleeve Antenna Diagram](image1)

When using the roof top antenna

![Roof Top Antenna Diagram](image2)

Rear view

![Rear View Diagram](image3)

Unit: mm [approx. inch]

Unless otherwise specified, tolerance is ±3% (however, tolerance is ±0.3 mm when below 10 mm).
### GP20

#### When using the sleeve antenna

![Diagram of GP20 sleeve antenna](image)

Unit: mm (approx. inch)

#### When using the roof top antenna

![Diagram of GP20 roof top antenna](image)

Unit: mm (approx. inch)

Unless otherwise specified, tolerance is ±3%
(however, tolerance is ±0.3 mm when below 10 mm).

#### Rear view

![Diagram of GP20 rear view](image)

Reboot switch
USB port (mini B type)
USB 2.0 compliant, for wireless communication configuration
LED
Status LED, ST1 (green/red), ST2 (green/red)
Antenna connector
GM10

When using the sleeve antenna

When using the roof top antenna
### MODEL AND SUFFIX CODES

#### GX20 Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optional code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GX20</td>
<td>-1</td>
<td></td>
<td>Paperless recorder (Panel mount type, Large display)</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td></td>
<td>Standard (Max. measurement channels: 100 ch)</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>/CM2</td>
<td>Large memory (Max. measurement channels: 500 ch)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>English, degF, DST (summer/winter time)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>920 MHz wireless (Master)</td>
<td>Optional features</td>
</tr>
</tbody>
</table>

#### GP20 Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optional code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP20</td>
<td>-1</td>
<td></td>
<td>Paperless recorder (Portable type, Large display)</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td></td>
<td>Standard (Max. measurement channels: 100 ch)</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>/CM2</td>
<td>Large memory (Max. measurement channels: 500 ch)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>English, degF, DST (summer/winter time)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>920 MHz wireless (Master)</td>
<td>Optional features</td>
</tr>
</tbody>
</table>

#### GM10 Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optional code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM10</td>
<td>-1</td>
<td></td>
<td>Data Acquisition Module for SMARTDAC+ GM</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td></td>
<td>Standard (Max. measurement channels: 100)</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>/CM2</td>
<td>Large memory (Max. measurement channels: 500)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>General</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>Always zero</td>
</tr>
<tr>
<td></td>
<td>/CM2</td>
<td></td>
<td>920 MHz wireless (Master)</td>
</tr>
<tr>
<td></td>
<td>/CS2</td>
<td></td>
<td>920 MHz wireless (Slave)</td>
</tr>
</tbody>
</table>

*1 /C2 and /C3 and /CM2 cannot be specified together.  
*2 This product can only be used in the US.  
*3 If you specify CM2, you must also specify the communication channel function (IMC option).  

#### GM90PS Model and Suffix Codes

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix Code</th>
<th>Optional code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM90PS</td>
<td>-1</td>
<td></td>
<td>Power Supply Module for SMARTDAC+ GM</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td>-1</td>
<td>Always –1</td>
</tr>
<tr>
<td>Area</td>
<td>N</td>
<td></td>
<td>General</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>1</td>
<td>100-240 V AC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>12-28 V DC</td>
<td></td>
</tr>
<tr>
<td>Power supply connection</td>
<td>D</td>
<td></td>
<td>Power inlet with UL/CSA cable</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td></td>
<td>Screw terminal (M4) (without power cable)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>Always zero</td>
</tr>
<tr>
<td>Optional features</td>
<td>/W</td>
<td></td>
<td>For 920 MHz wireless</td>
</tr>
</tbody>
</table>

*1 Only W (Screw terminal (M4)) is available for the power supply connection.  
*2 The only power supply module that can be used with GM10’s 920 MHz wireless communication (/CM2 and /CS2 options) is GM90PS-1N 1D0/W or GM90PS-1N 2W0/W.  

### OPTIONAL ACCESSORIES (SOLD SEPARATELY)

<table>
<thead>
<tr>
<th>Product</th>
<th>Model/part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeve antenna (indoor use)</td>
<td>A1061ER</td>
</tr>
<tr>
<td>Roof top antenna (indoor and outdoor use, cable length: 2.5 m)</td>
<td>A1062ER</td>
</tr>
</tbody>
</table>

Test Certificate (QIC, sold separately)  
QIC is available for each model.

#### User’s Manual

Product user’s manuals can be downloaded from the following URL. You will need Adobe Reader 7 or later by Adobe Systems.  

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